

REMARKS

Introduction

Claims 1-13 are pending, of which claims 1 and 11-13 are independent. Claims 11-13 are withdrawn from further consideration due to the previous restriction requirement.

Claims 1-7 have been amended to correct informalities in the claim language and to more clearly define the claimed subject matter. Claim 14 has been added. Support for the amendments and new claim 14 is found, for example, at paragraphs [0019]-[0021] and [0035] of the present application. No new matter has been entered.

Information Disclosure Statement

In the instant Office Action, the Examiner asserts that the information disclosure statement filed August 4, 2006 fails to comply with 37 C.F.R. 1.98(a)(3) because it does not include a concise explanation of the relevance of each patent listed that is not in the English language. Applicants respectfully request that JP 2004-2994, JP 11-246943 and JP 2842579 be considered because corresponding US and EP patents written in English were submitted as complete translations of the information into English. Applicants also note that English abstracts of JP 2000-017388, JP 2003-306747, JP 07-188852 (JP 2783145), JP 20022-104496 and JP 04-285142 (JP 3045795) were submitted as concise explanations of these non-English documents. Accordingly, Applicants respectfully request that the Examiner consider the above identified information disclosure statement and return the initialed copy of form PTO-1449 in the next official action.

Claim Rejection – 35 U.S.C. § 103

Claims 1-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the computer-generated English translation of Japanese Patent 2003-213372 (“JP ‘372”). Applicants respectfully traverse this rejection for at least the following reasons.

Applicants submit that JP ‘372 fails to disclose, at a minimum, a 40% or higher reduction of area and a 1,000 MPa or higher shear yield stress as recited by amended claim 1, and the steel wire manufactured by the method of JP ‘372 will not exhibit the claimed properties of the reduction of area and shear yield stress.

Regarding the limitation of 40% or higher reduction of area, the Examiner asserts, referring to paragraph [0028] of JP ‘372, that the steel wire of 8.0 mm diameter is reduced to 3.5 mm by hot rolling, which is about 60% reduction, and thus JP ‘372 discloses the claimed reduction range. However, Applicants respectfully submit that the hot rolling process of JP ‘372 is performed on a patented steel wire before being subjected to quenching-tempering and the steel wire at the rolling process has structures such as perlite. In contrast, claim 1 clearly recites the reduction of area of the steel wire **after** patenting/drawing and quenching-tempering, and the wire has a tempered martensite structure. As such, it is clear that JP ‘372 fails to disclose or even suggest the reduction of area after quenching-tempering as recited by claim 1.

Regarding the limitation of a 1,000 MPa or higher shear yield stress, Applicants note that amended claim 1 recites that the shear yield stress of the wire is 1000 MPa or higher when evaluated under a condition in which the wire has been subjected to heat treatment for at least 2 hours at a temperature ranging from 420°C to 480°C. The claimed subject matter does not intend to produce a steel wire having shear yield stress of 1000 MPa or higher by performing a heat treatment for at least 2 hours at a temperature ranging from 420°C to 480°C (see, paragraphs

[0015] and [0040] of the present application). The “heat treatment for at least 2 hours at a temperature ranging from 420°C to 480°C” is conducted as a part of evaluating of the wire, not as a part of the manufacturing process of the wire.

The Examiner asserts that, while JP ‘372 does not teach that the shear yield stress of the steel wire is 1000MPa or higher, the steel wire can be expected to have such a property because constituents and producing methods are closely met. Applicants respectfully submit that the manufacturing process of JP ‘372 is different from the present application and thus the claimed properties of the reduction of area and the share yield stress cannot be expected by JP ‘372.

JP ‘372 appears to disclose a manufacturing process of a spring steel wire including melting the steel, subjecting the resultant to hot forging and hot rolling, and then patenting and drawing, followed by quenching-tempering (see, paragraph [0028] of JP ‘372). In contrast, the manufacturing method of the present application further includes austenitizing and isothermal transformation processes (see, paragraphs [0014], [0020] and [0036] of the present specification). Specifically, the austenitizing step in the present application requires that the steel be heated at 900-1,050°C for 60 to 180 seconds. JP ‘372 discloses “patenting conditions are predetermined in which heating temperature is 600°C and heating time is 40 seconds”(see, paragraph [0028] of JP ‘372). This temperature range indicates that JP ‘372’s patenting is equivalent to the isothermal transformation process in the present application. Thus, the manufacturing process of JP ‘372 lacks the austenitizing step as required in the present application.

The experimental results disclosed in the present application indicate that the manufacturing process’ lack of austenitizing step does not produce the steel wire having claimed properties. Applicants submit that conditions III to VI of Table 2 in paragraph [0038] of the present application show the cases that the austenitizing conditions in patenting do not meet the

desired conditions, i.e., heated at 900-1,050°C for 60 to 180 seconds. Table 4 in paragraph [0046] of the present application shows the evaluation results for the fatigue properties of the steel wires subjected to the patenting under the conditions III to VI (Samples No. 24-27). From these results, it is clear that the austenitizing step in which the steel is heated at 900-1,050°C for 60 to 180 seconds is indispensable to achieve the claimed reduction of area and the shear yield stress. Since JP '372 does not have the austenitizing step, the steel wire of JP '372 will not have the claimed properties of a 40% or higher reduction of area and a 1,000 MPa or higher shear yield stress.

As such, it is clear that JP '372 does not render claim 1 and any claim dependent thereon obvious. Thus, Applicants respectfully request that the Examiner withdraw the rejection of claims 1-10 under 35 U.S.C. § 103(a).

New Claim

Since new claim 14 depends upon claim 1, this claim is patentable over JP '372. In addition, since new claim 14 recite the austenitizing step, JP '372, which lacks austenitizing step, does not render claim 14 obvious.

CONCLUSION

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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